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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:)
PIKE ET AL.) Examiner: LOURDES CRUZ
Serial No. 09/741,754) Art Unit: 2827
Filing Date: DECEMBER 19, 2000)
For: METHOD FOR MAKING ELECTRONIC)
DEVICES INCLUDING SILICON AND)
LTCC AND DEVICES PRODUCED)
THEREBY)

APPELLANTS' APPEAL BRIEF

Mail Stop APPEAL BRIEF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith is Appellant's Appeal Brief. The Commissioner is hereby authorized to charge the fee for filing the appeal brief in the amount of \$330.00 to Deposit Account No. 08-0870. The Commissioner is authorized to charge or credit any discrepancies in fee amounts to Deposit Account No. 08-0870.

(1) REAL PARTY IN INTEREST

The real party in interest is Harris Corporation.

(2) RELATED APPEALS AND INTERFERENCES

At present there are no related appeals or interferences.

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(3) STATUS OF THE CLAIMS

The rejection of all of the pending Claims 21-34 is being appealed. These claims are listed in the attached Appendix (9).

Claims 1-20 have been previously canceled in view of a restriction requirement without prejudice to Applicants' right to file a divisional application directed to the subject matter thereof.

(4) STATUS OF AMENDMENTS

All amendments have been entered and there are no further pending amendments.

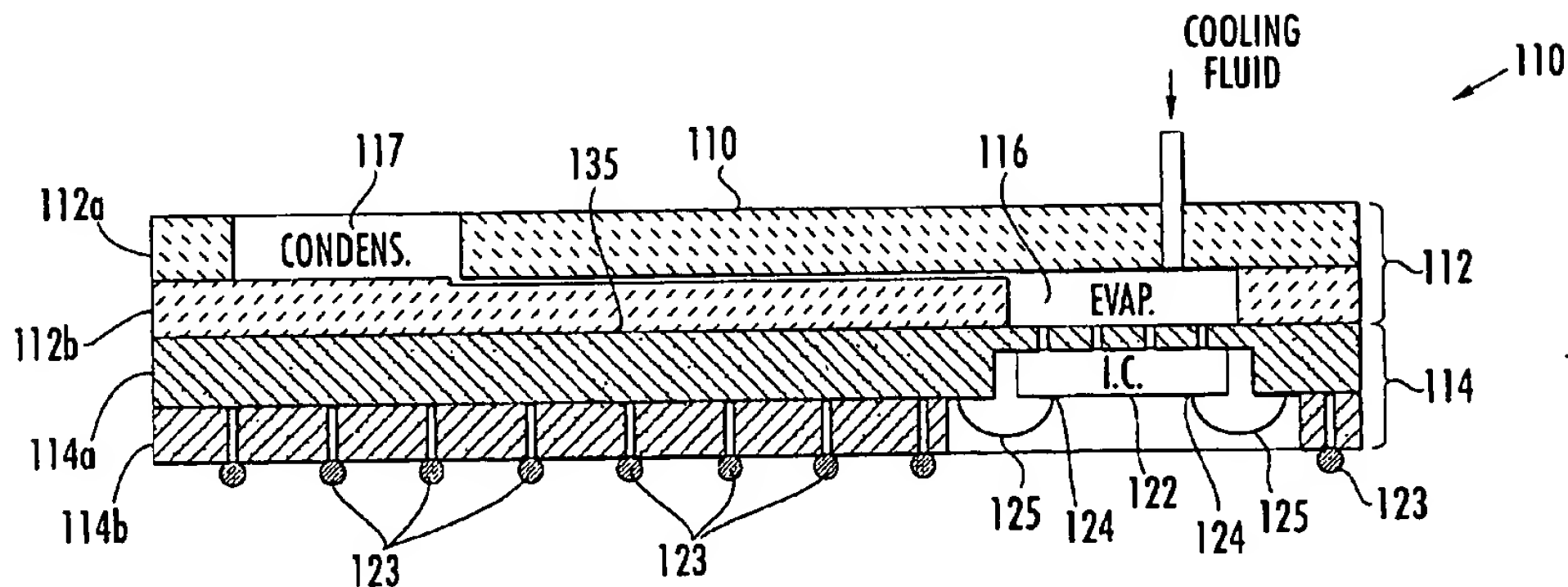
(5) SUMMARY OF THE INVENTION

With reference to FIG. 3 from the application reproduced below for convenience of explanation, the electronic device of the present invention **110** differs from the prior art device in that the conventional adhesive layer is replaced by an anodically bonded interface **135**. The electronic device **110** illustratively mounts an integrated circuit **122** in the package **111**. The electronic device **110** illustratively includes a first member **112** comprising silicon, and a second member **114** comprising a low temperature co-fired ceramic (LTCC) material. The first and second members **112**, **114** have opposing surfaces thereof anodically bonded together to form a hermetic seal at the interface **135** therebetween. (Page 7, lines 13 to 31).

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The first and second members **112**, **114** have opposing generally planar major opposing surfaces being anodically bonded together. The first member **112** includes at least one first micro-fluidic cooling structure therein, such as the illustrated evaporator **116**. The second member **114** may include at least one second micro-fluidic cooling structure aligned with the at least one first micro-fluidic cooling structure of the first member **112**. The electronic device **110** also illustratively includes an integrated circuit **122** adjacent the micro-fluidic passageways **130** of the second member **114**. The integrated circuit **122** also illustratively includes electrical connections **124** which are brought out to the external electrical connections **123**. (Page 7, line 32 to page 8, line 25).

Referring now additionally to the schematic diagram FIG. 6 from the application also reproduced below, the first and second members **112**, **114** may have substantially planar major opposing surfaces, so that anodic bonding provides a uniform

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Anodic bonding advantageously provides a hermetic seal between the two members, and may significantly reduce or eliminate the loss of cooling fluid at the interface between the two members which could otherwise occur. It is believed that the anodic bonding causes a coordinate covalent matrix to form at the interface **135** between the first and second members **112**, **114** as schematically illustrated. (Page 11, lines 4 to 11).

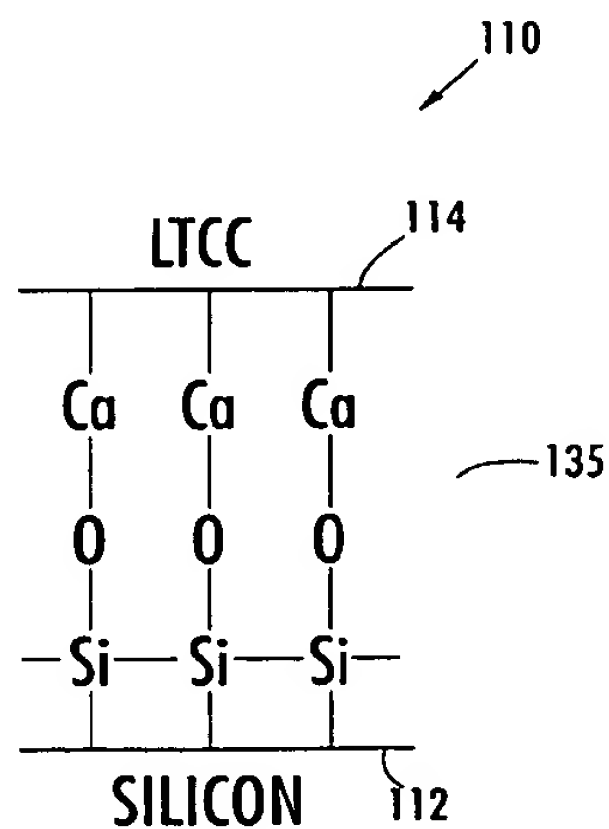


FIG. 6.

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(6) ISSUE

The issue presented on appeal is whether the broadest reasonable meaning of the claim recitation "first and second members having opposing surfaces thereof anodically bonded together to form a hermetic seal therebetween" should be treated as a meaningless statement of process that does not distinguish the claimed invention from a prior art reference showing a soldered connection?

(7) GROUPING OF CLAIMS

All Claims 21-34 stand or fall together.

(8) ARGUMENTS

A. The Legal Principles

The MPEP § 2111, citing *In re Morris*, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997), sets forth the appropriate legal principles to resolve the instant appeal.

"[T]he 'PTO applies to verbiage of the proposed claims the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, taking into account whatever enlightenment by way of definitions or otherwise that may be afforded by the written description contained in applicant's specification.'"

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The relatively recent case of *In re American Academy of Science Tech Center*, 2004 U.S. App. LEXIS 9382, (Fed Cir. 2004) is also illustrative. A copy of this case that was only recently decided on May 13, 2004 is enclosed for the Board's convenience as Appendix (10).

The court in *In re American Academy* looked to determine whether the Background of the Invention of the specification disclaimed subject matter, and looked to definitional support in the specification. In *In re American Academy*, the Federal Circuit held that the term "user computer" should not be limited to only a single-user computer as advocated by the patentee in a reexamination proceeding, at least because the specification stated that a "user" could be "a person, another device or machine" which suggested the "user computer" could be a mainframe or minicomputer.

B. The Nguyen Reference

During prosecution the Examiner used the Nguyen patent as the sole prior art reference, but with multiple different interpretations at different times. Nguyen discloses packaging for high-powered devices, such as IGBT's that includes a direct bonded copper substrate (DBC), such as BeO, soldered directly between the heat generating surface of the IGBT's and a liquid cooled heatsink. The heatsink may be a microchannel cooled heatsink as disclosed at column 3, lines 46-47. This improves

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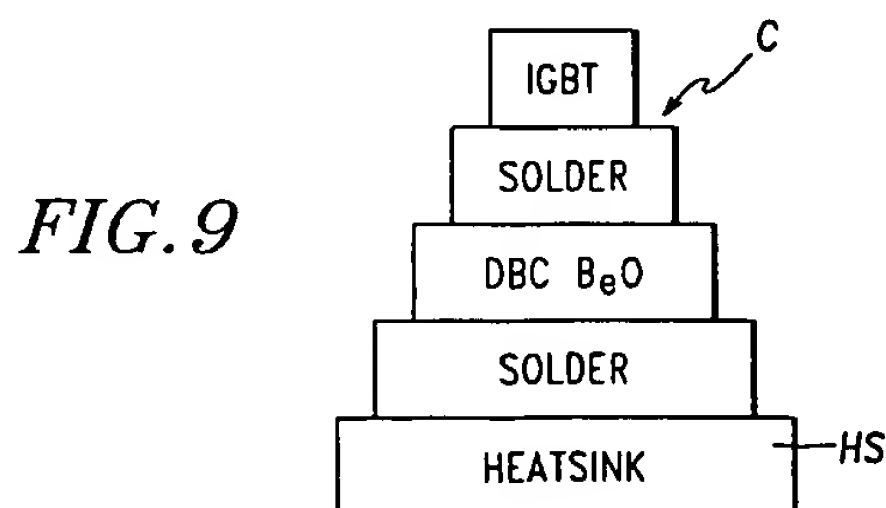
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thermal management and is applicable for use in a switching circuit for a three-phase electric traction motor.

At column 5, lines 3 to 10, Nguyen also discloses that:

"[a]lthough a DBC BeO substrate is preferred, it should be understood that any high thermal conductivity substrate, such as high-conductivity ceramics, or aluminum nitride, or a thermal clad layer such as a Bergquist material (for lower current applications) or CVD may be used in place of the BeO substrate, so long as the substrate is metallized by copper or other suitable metals." (Emphasis added).

The structure disclosed by Nguyen is perhaps best appreciated by reference to the schematic "stack up packaging design" found in FIG. 9 from Nguyen reproduced below. The top half of the stack of Nguyen is of most interest to the present application, as the Examiner is contending that the IGBT comprises silicon and is the first member, the BeO material is a ceramic and is the second member, and the intervening copper layer and solder layer combination is the anodically bonded interface, as will be described in greater detail below.



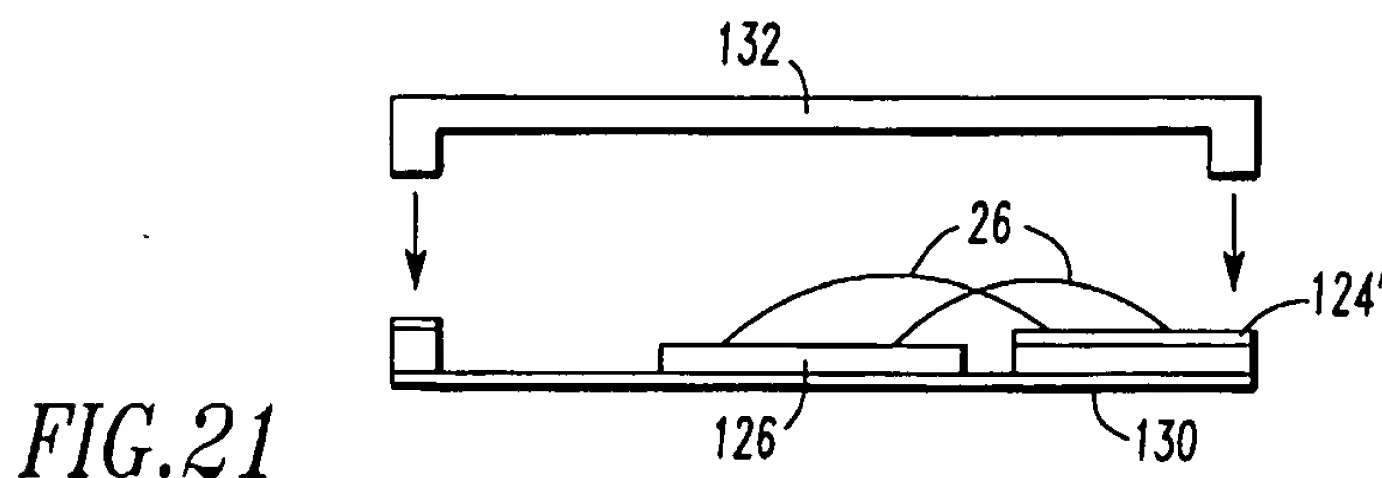
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C. The Current Rejections

In the final Official Action of January 27, 2004, the Examiner rejected the claims based upon the erroneous contention that a "silicon gel" formed a hermetic seal with the high thermal conductivity substrate of Nguyen. In view of Applicants' response of March 15, 2004 respectfully pointing out that Nguyen specifically discloses that "silicon gel" cannot form a hermetic seal, the Examiner properly withdrew this rejection based on the Advisory Action of April 2, 2004. Nevertheless, in the Advisory Action, the Examiner has now formulated yet new rejections based on Nguyen as follows:

"While Applicant [sic] argues that a hermetic seal as claimed is not disclosed by the prior art, see that the claim recites a hermetic seal 'therebetween.' See that by the prior art - fig. 21 - of a hermetic seal between members 126 and 130, the prior art is disclosing a hermetic seal 'therebetween' two members 126 and 128. See Fig. 13 - bottom - wherein it is inherent that for this modification to be possible the hermetic seal will be 'therebetween' elements 126 and 42."

To follow the Examiner's rejection, FIG. 21 from the Nguyen patent is reproduced below.



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Applicants are unable to find reference number 128 in FIG. 21, nor does it seem applicable to the embodiment shown in this figure. Applicants will treat the recitation of number 128 as an inadvertent error when the Examiner meant 130 instead. The Examiner is correct in that "[t]he collector surface of the IGBT switch 126 is soldered to a copper plate 130." The specification provides this at column 9, lines 44-45. Nguyen also discloses that a hermetic seal with a cover may be formed by welding or soldering. For example, Nguyen provides:

"In order to satisfy the stringent requirements of military applications, the present invention is easily adapted to be hermetically sealed. As seen in FIG. 10, the IGBT switch of the present invention includes a collector pad CP separated from an emitter pad EP by a gap 40. Although a cover may be designed to fill the gap 40, it is preferable to modify the packaging structure in the manner shown in FIG. 19.

In FIG. 19, the emitter pad CP is elevated from the collector pad EP by an additional layer 120. A solderable insulated lid 122 can be adapted to fit over the emitter pad EP so as to hermetically seal the package within its walls. As seen in the elevated view of FIG. 20, a preferred embodiment of the present invention contemplates the use of a copper ring 124 for the emitter pad EP which can be used to solder or braze the hermetic lid 122. A weldable or solderable lid is required to be used with the ring 124.

As a further variation, a 'hockey puck'

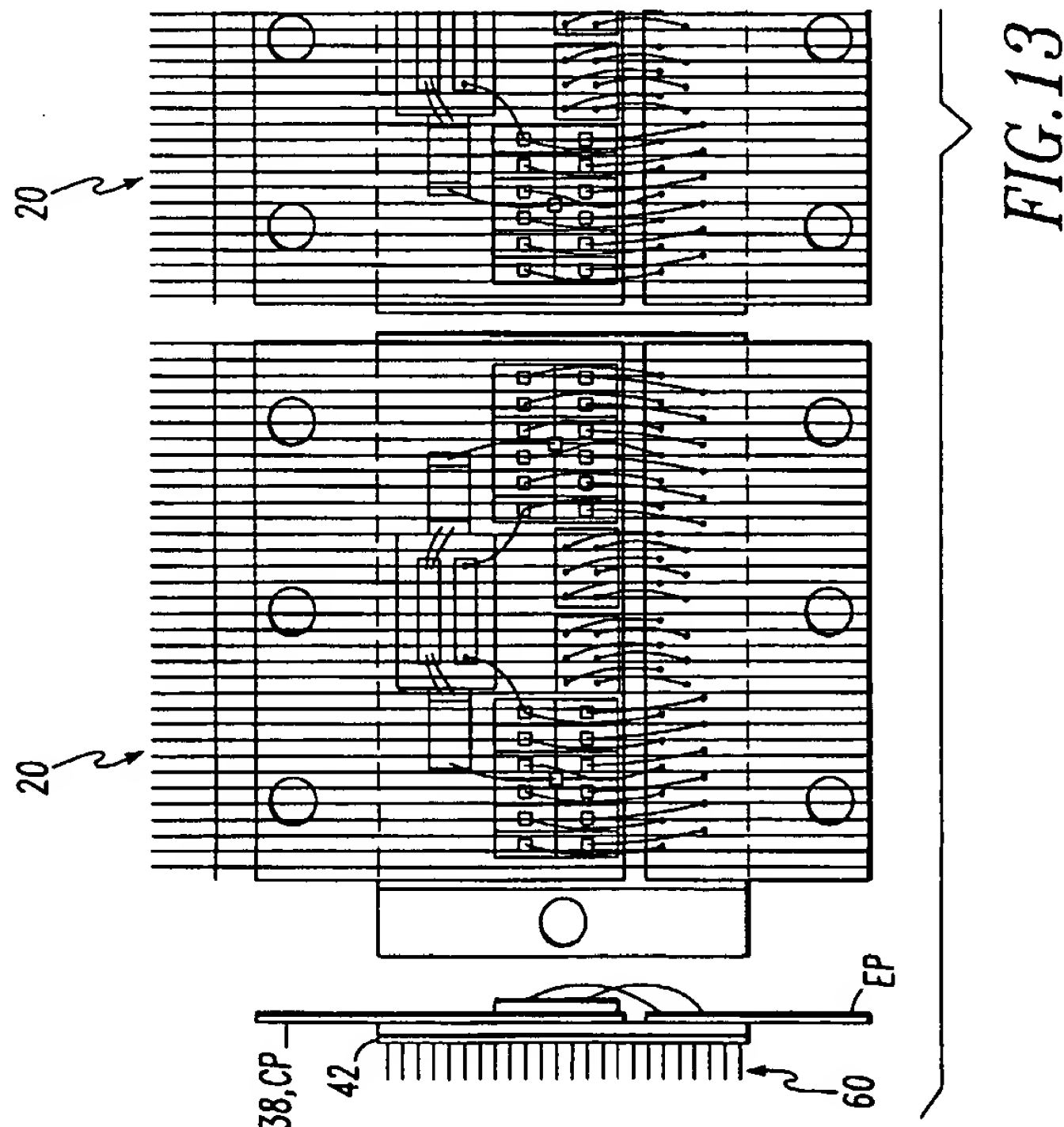
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packaging design can be used. FIG. 21 shows the hockey puck design, wherein the wings of the emitter pad EP and collector pad CP are omitted. Instead, a metal (or other electrically conductive) lid 132 is welded or soldered to the copper ring 124' which is connected by wire bonding to the emitter terminals of the IGBT switch 126." (Col. 9, lines 22-44). (Emphasis added).

Turning now to FIG. 13 from the Nguyen patent reproduced below, Applicants address the rejection based upon the lower portion of this figure.



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Although reference number 126 is not found in FIG. 13, related FIG. 10 makes clear that if 126 were labeled, it would be for the chip on the upper side of the collector pad labeled "38, CP" from the copper layer 42. This rejection also includes intervening copper and solder layers between the ceramic and silicon members.

Despite the intervening layers of solder and copper in the cited structures of Nguyen, Applicants respectfully submit that the Examiner is impermissibly reading these copper and solder structures as the claimed recitation of "anodically bonded together" opposing surfaces of the first and second members to form a hermetic seal.

C. The Broadest Reasonable Meaning of "First And Second Members Having Opposing Surfaces Thereof Anodically Bonded Together To Form A Hermetic Seal Therebetween" Does Not Cover A Soldered Connection

Anodic bonding is described in a number of the prior art references already made of record for the present application. For example, U.S. Patent Nos. 3,783,218; 5,820,648; 5,866,469 and 6,013,562 all describe anodic bonding, wherein an electrical current flow, and at least typically pressure and/or heat are used to form an anodic bond.

U.S. Patent No. 5,820,648 col. 2, at lines 35-53 describes its approach to anodic bonding as follows:

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"First, the principle of the anodic bonding process using the light irradiation will be described below.

When a glass substrate and a Si substrate are to be joined by the anodic bonding, the network structure is relaxed by cutting weak binding portions in the network structure of glass or exciting it with oscillation, or modifier ions in the glass are diffused by giving an energy exceeding an activation energy for the diffusion of modifier ions. In order to have a certain directivity in the diffusion of modifier ions, voltage is applied between the cathode, the glass substrate, and the anode, the Si substrate, to generate an electric field. Thus, modifier ions are attracted to the cathode side and oxygen ions are attracted to the anode side, so that a depletion layer is produced near the bonding interface on the glass side, whereby a great electrostatic attractive force is generated between the glass substrate and the Si substrate. The gap between both the substrates becomes atomic order due to this electrostatic attractive force, so that solid phase bonding is possible."

Also relevant to use of the term "anodically bonded" and what it means to those of skill in the art, is the listing of seventy-seven U.S. patents attached as Appendix (11). Each of these patent uses this term one or more times in the claims and represents a search of U.S. Patent available online from 1976 to the present. Accordingly, one of skill in the art will

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appreciate that anodic bonding produces a structural interface and that structural interface does not mean a soldered connection.

Applicants have also used their specification to define anodic bonding and the bonding interface provided thereby. In particular, in the background of the invention, Applicants highlight the prior art shortcomings of the use of an adhesive layer between the silicon and LTCC members. At page 2, line 30, it is also noted that in the prior art, metal layers may be used to join the first and second members together. In the detailed description of the preferred embodiments, Applicants provide:

"the first and second members **112, 114** may have substantially planar major opposing surfaces, so that anodic bonding provides a uniform bond across these surfaces to reduce possible stress effects which may otherwise occur due to the difference in thermal coefficients of expansion of the two different materials. The anodic bonding provides a secure and uniform hermetic seal between the members **112, 114** and while overcoming the disadvantages described above resulting from using an adhesive. . . . Anodic bonding advantageously provides a hermetic seal between the two members, and significantly reduces or eliminates the loss of cooling fluid at the interface between the two members which could otherwise occur. It is believed without applicants wishing to [be] bound thereto that the anodic bonding causes a coordinate covalent matrix to form

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at the interface **135** between the first and
second members **112, 114. . .**" (Page 10,
line 19 to page 11, line 12).

Giving the term "anodically bonded" its broadest
reasonable meaning, Applicants respectfully disagree with the
Examiner's assertion that Nguyen discloses first and second
members having opposing surfaces anodically bonded together to
form a hermetic seal therebetween as in the claimed invention.
Of course, Applicants also respectfully disagree with the
Examiner's contention in the final Official Action that:
"[a]nodically bonded' is a statement of process that does not
distinguish the present invention from that in the prior art."
Accordingly, all of the claims of the present application are
patentable over the Nguyen patent.

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D. Conclusions

In view of the foregoing arguments, it is respectfully submitted that all of the claims are patentable over the prior art. Accordingly, the Board of Patent Appeals and Interferences is respectfully requested to reverse the earlier unfavorable decision of the Examiner.

Respectfully submitted,



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9. APPENDIX OF CLAIMS

21. (Original) An electronic device comprising:
a first member comprising silicon; and
a second member comprising a low temperature co-fired
ceramic (LTCC) material;

said first and second members having opposing surfaces
thereof anodically bonded together to form a hermetic seal
therebetween.

22. (Original) An electronic device according to
Claim 21 wherein said first and second members have opposing
generally planar major opposing surfaces.

23. (Original) An electronic device according to
Claim 21 wherein at least one of said first and second members
comprises at least one cooling structure therein.

24. (Original) An electronic device according to
Claim 21 wherein said first member further comprises at least
one first micro-fluidic cooling structure therein.

25. (Original) An electronic device according to
Claim 24 wherein said at least one first micro-fluidic cooling
structure comprises an evaporator.

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26. (Original) An electronic device according to Claim 24 wherein said second member further comprises at least one second micro-fluidic cooling structure aligned with the at least one first micro-fluidic cooling structure.

27. (Original) An electronic device according to Claim 26 wherein said at least one second micro-fluidic cooling structure comprises at least one micro-fluidic passageway.

28. (Original) An electronic device according to Claim 26 further comprising at least one integrated circuit adjacent said at least one second micro-fluidic cooling structure.

29. (Original) An electronic device according to Claim 28 wherein said at least one integrated circuit comprises electrical connections; and wherein the second member comprises external electrical connections connected to the electrical connections of said at least one integrated circuit.

30. (Original) An electronic device comprising:
a first member comprising silicon and having at least one first micro-fluidic cooling structure therein;
a second member comprising a low temperature co-fired ceramic (LTCC) material and having at least one second micro-

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fluidic cooling structure aligned with the at least one first
micro-fluidic cooling structure of said first member;

said first and second members having opposing surfaces
thereof anodically bonded together to form a hermetic seal
therebetween; and

at least one integrated circuit adjacent said at least
one second micro-fluidic cooling structure.

31. (Original) An electronic device according to
Claim 30 wherein said first and second members have opposing
generally planar major opposing surfaces.

32. (Original) An electronic device according to
Claim 30 wherein said at least one first micro-fluidic cooling
structure therein comprises an evaporator.

33. (Original) An electronic device according to
Claim 30 wherein said at least one second micro-fluidic cooling
structure comprises at least one micro-fluidic passageway.

34. (Original) An electronic device according to
Claim 30 wherein said at least one integrated circuit comprises
electrical connections; and wherein the second member comprises
external electrical connections connected to the electrical
connections of said at least one integrated circuit.

APPENDIX (10)

1 of 1 DOCUMENT

IN RE AMERICAN ACADEMY OF SCIENCE TECH CENTER**03-1531****UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT***2004 U.S. App. LEXIS 9382***May 13, 2004, Decided**

PRIOR HISTORY: [*1] Appealed from: United States Patent and Trademark Office, Board of Patent Appeals and Interferences. (Reexamination No. 90/003,463).

DISPOSITION: Affirmed.

LexisNexis (TM) HEADNOTES - Core Concepts:

COUNSEL: John M. Collins, Hovey Williams LLP, of Kansas City, Missouri, argued for appellant.

C. Edward Polk, Jr., Associate Solicitor, Office of the Solicitor, United States Patent and Trademark Office, of Arlington, Virginia, argued for appellee. With him on the brief were John M. Whealan, Solicitor; and Linda Moncys Isacson, Associate Solicitor.

Barry E. Bretschneider, Morrison & Foerster LLP, of McLean, Virginia, for amicus curiae Novell, Inc. With him on the brief was Charles C. Carson.

JUDGES: Before RADER, BRYSON, and GAJARSA, Circuit Judges.

OPINIONBY: BRYSON

OPINION: BRYSON, Circuit Judge.

This is an appeal from a decision of the United States Patent and Trademark Office's Board of Patent Appeals and Interferences in a reexamination proceeding, Appeal No. 2003-0349. The Board upheld a patent examiner's rejection, in reexamination, of several claims of *U.S. Patent No. 4,714,989* ("the '989 patent"). The owner of the patent, American Academy of Science Tech Center, seeks review of the Board's decision. We affirm.

I

Before the proliferation [*2] of personal computers, it was common for a multiple-user computer system to be arranged so that each user would interface with a mainframe computer by using a so-called "dumb terminal," i.e., a terminal that did not contain processors and performed only input and output functions. Several dumb terminals would be connected to a single mainframe computer, which would run the user applications. The mainframe computer would receive input from and provide output to users through the dumb terminals. The user applications run by the mainframe computer would access data that was stored in a database residing on the mainframe.

In contrast to systems using a mainframe in conjunction with dumb terminals, the '989 patent describes a network in which the processing of user applications is distributed among several computers. In the '989 patent system, user applications are run on the user stations, while the database resides on a dedicated database computer. Several user stations are networked to the database computer so that a user application running on a user station can store data to and retrieve data from the database residing on the database computer. The patent describes using a "data [*3] base simulator" to "enable[] an application program . . . at the user station to call for storage or retrieval of data from the data center as though it were calling for data from a data base resident at the user station" '989 patent, col. 6, ll. 57-62.

The '989 patent was issued on December 22, 1987, on an application filed on October 20, 1986. The 1986 application was a continuation of an application filed on February 19, 1982. In 1991, American Academy sued

Novell, Inc., in the United States District Court for the Northern District of California, alleging that Novell had infringed the '989 patent. In response, Novell filed a reexamination request on June 6, 1994. The district court stayed the litigation pending the outcome of the reexamination.

During the reexamination, the examiner rejected each of the claims of the '989 patent as anticipated by several references. Four of those references, the Canaday, Lowenthal, Passafiume, and Hsiao references, are at issue in this appeal. The Canaday, Lowenthal, and Passafiume references describe what American Academy calls "back-end" systems. In such back-end systems, several mainframe computers interface with a single database [*4] or "back-end" computer. The mainframe computers run user applications and communicate with the database computer to store and retrieve data from a database that resides on the database computer. The Hsiao reference describes networking several personal computers to a database computer that is connected to a database. n1

n1 American Academy argues that the Hsiao reference does not anticipate the invention because Hsiao lacks an enabling disclosure. In light of our conclusion that the Board did not err in finding the other references to be anticipatory, it is unnecessary for us to address that argument.

The claims under reexamination require a plurality of "general purpose user computers" that are connected to a "data center computer." The examiner determined that the mainframe computers in the asserted references (and the personal computers of Hsiao) anticipated the "general purpose user computers" element of the claims under examination. The examiner also found that the references taught an additional disputed [*5] claim element, that of "indirectly issuing data base calls," since in each of the references database calls from the user application to the database manager program at the database computer must be sent through some other program or hardware.

In response to those rejections, American Academy submitted arguments and declarations to the effect that the claims of the '989 patent are limited to user computers, such as personal computers, that are each dedicated to a single user. American Academy also argued that the "indirectly issuing" element should be limited to cases in which the user application, when making a database call, is not aware that it is making a remote database call but instead believes that it is making a local database call to the computer running the user

application. American Academy thus in effect urged that the "indirectly issuing" limitation should be limited to the use of a database simulator program such as that described in the '989 specification. The examiner was not persuaded by American Academy's arguments and continued to reject the claims both as anticipated and as obvious in light of the cited references.

American Academy appealed the examiner's rejections [*6] to the Board, which affirmed the rejections. Although the examiner had been persuaded by the time of appeal that the patent was limited to single-user computers, the Board adopted a broader construction of the claim term "user computer" that encompassed any computer "capable of running application programs for a user." That construction reached the back-end systems of the prior art. The Board also construed the claim term "indirectly issuing" broadly to include "the request going through some other component before it is sent to the data base."

American Academy filed a rehearing request, asserting that the Board's claim construction was broader than the examiner's and that the Board's decision was thus based on a new ground of rejection. The Board granted the request, but it concluded that even under American Academy's construction it would have been obvious to replace the mainframe computers of the prior art with personal computers. In response to a further rehearing request in which American Academy asserted that the Board's obviousness rejection also constituted a new ground of rejection, the Board directed that the issue of obviousness be further prosecuted.

In subsequent proceedings [*7] before the examiner, American Academy submitted additional declarations, both as to claim construction and as to the issue of obviousness. The examiner, however, again rejected the claims as anticipated and obvious over the prior art.

American Academy appealed the rejections to the Board for a second time. The Board addressed claim 1 in detail, finding that it was representative of the other claims on appeal. Based on the principle that during examination claims should be given their broadest reasonable construction, the Board construed the term "user computer" to encompass the mainframe computers of the prior art. The Board explained that "although the patent disclosure does refer to servicing a user in the singular, it also notes that the user could be a person, another device, or machine" The Board added that it was not persuaded by the declarations submitted by American Academy because "the declarations offer no evidence in support of appellant's definition" and "instead . . . merely offer [the declarant's] opinions as to what the artisan would have understood upon reading the

patent disclosure." The Board rejected American Academy's argument that a broad construction [*8] of the term "user computer" would vitiate the word "user." Under its definition, the Board explained, the term "user computer" did not include all computers, but excluded special purpose computers, such as those that "are not intended to interface with a user for application programming under any circumstances."

The Board further concluded that the broadest reasonable construction of "indirectly issuing a database call" requires only "that a request from the host computer go through some other component before it is sent to the database." The Board found American Academy's arguments to the contrary unpersuasive and again found the declarations submitted in support of American Academy's narrower construction to be unsupported by the evidence before the examiner. Finally, the Board upheld the alternative obviousness rejections, concluding that the examiner had established a prima facie case of obviousness that was unrebutted by American Academy's arguments or evidence.

II

We review the Board's legal conclusions de novo and uphold its factual findings if they are supported by substantial evidence. See *In re Bass*, 314 F.3d 575, 576 (Fed. Cir. 2002). Anticipation [*9] is a question of fact, which we review for substantial evidence, see *In re Hyatt*, 211 F.3d 1367, 1371-72 (Fed. Cir. 2000), while claim construction is a matter of law, reviewed de novo, see *In re Baker Hughes Inc.*, 215 F.3d 1297, 1301 (Fed. Cir. 2000). The primary issue on appeal is the construction of the terms "user computer" and "indirectly issuing." Construing those claim terms broadly, the Board found that each of the references, Canaday, Lowenthal, Passafiume, and Hsiao, taught both the use of "user computers" and systems that "indirectly issue" database calls. American Academy does not challenge the sufficiency of the evidence with respect to the Board's decision on any other claim limitations.

During examination, "claims . . . are to be given their broadest reasonable interpretation consistent with the specification, and . . . claim language should be read in light of the specification as it would be interpreted by one of ordinary skill in the art." *In re Bond*, 910 F.2d 831, 833 (Fed. Cir. 1990); accord *Bass*, 314 F.3d at 577 ("The PTO must apply the broadest reasonable meaning to the claim language, taking [*10] into account any definitions presented in the specification."); *In re Cortright*, 165 F.3d 1353, 1358 (Fed. Cir. 1999) ("Although the PTO must give claims their broadest reasonable interpretation, this interpretation must be

consistent with the one that those skilled in the art would reach."); *Hyatt*, 211 F.3d at 1372. The "broadest reasonable construction" rule applies to reexaminations as well as initial examinations. See *In re Hiniker Co.*, 150 F.3d 1362, 1368 (Fed. Cir. 1998); *In re Yamamoto*, 740 F.2d 1569, 1571 (Fed. Cir. 1984). Giving claims their broadest reasonable construction "serves the public interest by reducing the possibility that claims, finally allowed, will be given broader scope than is justified." *Yamamoto*, 740 F.2d at 1571; accord *Hyatt*, 211 F.3d at 1372; *In re Zletz*, 893 F.2d 319, 322 (Fed. Cir. 1989) ("An essential purpose of patent examination is to fashion claims that are precise, clear, correct, and unambiguous. Only in this way can uncertainties of claim scope be removed, as much as possible, during the administrative process.").

Construing [*11] claims broadly during prosecution is not unfair to the applicant (or, in this case, the patentee), because the applicant has the opportunity to amend the claims to obtain more precise claim coverage. See *Yamamoto*, 740 F.2d at 1571-72 ("Applicants' interests are not impaired since they are not foreclosed from obtaining appropriate coverage for their invention with express claim language. An applicant's ability to amend his claims to avoid cited prior art distinguishes proceedings before the PTO from proceedings in federal district courts on issued patents. When an application is pending in the PTO, the applicant has the ability to correct errors in claim language and adjust the scope of claim protection as needed."); *Zletz*, 893 F.2d at 321 ("During patent prosecution when claims can be amended, ambiguities should be recognized, scope and breadth of language explored, and clarification imposed."); *Hyatt*, 211 F.3d at 1372.

American Academy appeals the rejection of claims 1-17 and 20-26 to this court. However, the parties agree that the construction of the terms "user computer" and "indirectly issuing" is determinative as to all the claims [*12] on appeal. Claim 1 is thus representative of all the claims at issue for purposes of the appeal. It claims:

1. A method of operating a distributed data processing system including a plurality of independent, not necessarily uniform, general purpose user computers to run respective user application programs to process user data and a data center computer to store, retrieve, and update user data, said user computers being selectively interconnected with said data center computer by respective data communication hardware over data

communication network means, said method comprising the steps of:

(a) managing in a data center computer by means of a data base manager program a user data base of user data items to perform data operations of storing, updating, and retrieving said user data items in response to data base calls for such operations from a user computer;

(b) running a user application program in a general purpose user computer to process user data, said user application program indirectly issuing data base calls for data operations regarding user data items in response to requirements for said data operations by said user application program;

(c) in response to [*13] a data base call regarding a user data item from a user application program, initiating by said user computer only a data communication link with said data center computer over data communication network means;

(d) communicating said data base call from said user computer to said data center computer;

(e) performing by said data center computer said data operation regarding said user data item defined by said data base call; and

(f) communicating an appropriate response to said data base call from said data center computer to said user computer.

(emphasis added).

A

American Academy first argues that the term "user computer" should be limited in the '989 patent to refer only to single-user computers. Although the claim does not contain words of restriction that would suggest that narrow construction, American Academy argues that the specification makes clear that the claim language should be given an interpretation narrower than the ordinary meaning of the claim language would suggest. This court has recognized that a patentee "may demonstrate an intent to deviate from the ordinary and accustomed meaning of a claim term by including in the specification expressions [*14] of manifest exclusion or restriction,

representing a clear disavowal of claim scope." *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1325 (Fed. Cir. 2002); accord *Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1368 (Fed. Cir. 2003) ("A patent applicant may consistently and clearly use a term in a manner either more or less expansive than its general usage in the relevant art, thereby expanding or limiting the scope of the term in the context of the patent claims."); *SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1343-44 (Fed. Cir. 2001).

In arguing that the specification of the '989 patent makes clear that multi-user computers, such as mainframes and minicomputers, do not fall within the definition of "user computer" as that term is used in the '989 patent, American Academy points to language in the Background of the Invention portion of the specification discussing configurations that use mainframes connected to dumb terminals. According to American Academy, by pointing out the deficiencies with multi-user computers such as mainframes, the specification excludes those mainframes from the definition [*15] of user computers.

It is true that the specification suggests that, as the number of users using a mainframe increases, the amount of processing power necessary to run all the user applications increases, and consequently the cost of a mainframe capable of handling all the requisite processing increases. '989 patent, col. 1, ll. 26-41. The specification continues by describing why one potential solution--using several processors in communication with one another to perform the role of a single processor--is inadequate. In that system, the specification explains, the overhead necessary for communication between multiple processors would consume substantial computing resources. *Id.*, col. 1, l. 42 to col. 2, l. 3.

The Background of the Invention thus highlights the problems inherent in performing all the processing necessary to run multiple user applications at a central computer, whether that computer includes only one very expensive processor or several less expensive processors consuming valuable computing resources talking to one another. The specification does not, however, disclaim the networking of mainframes to a central computer that is devoted to database access. To the contrary, the Background of the Invention appears to allow a configuration in which multiple user applications are run separately on several mainframe computers, which communicate with a database computer that is dedicated to the functions of storing and retrieving data. In such a case, several less expensive mainframe computers could be used to manage the processing of an increasing number of user applications while the overhead associated with communication among processors would

be limited to communications related to the storage and retrieval of data.

American Academy argues that the specification describes the user stations in a way that distinguishes a "user computer" from a multi-user computer. In particular, American Academy points to a portion of the specification that provides as follows:

the system of the present invention includes a plurality of user stations each dedicated to servicing a user (which could be a person, another device, or machine) and each functioning as a stand-alone computer, having its own central processing unit, typically a microprocessor, and equipment by which the user can communicate with the central processing unit, typically a video display [*17] and keyboard terminal. The user stations may have other peripheral equipment as well, such as disk drives, printers, card readers, or the like. The user stations service the users by executing application programs supplied by the users.

'989 patent, col. 2, ll. 35-47 (emphasis added). American Academy notes that the term "user station," which appears to be synonymous with "user computer" as used in the '989 patent, is referred to as "dedicated to servicing a user." That reference, according to American Academy, indicates that a "user station" or "user computer" must be a computer that is dedicated to a single user.

As the Director of the PTO points out in his brief, however, the specification states that a "user" can be "a person, another device, or machine," which suggests that the "user computer" could be a mainframe or minicomputer. The Director also points to a portion of the specification that provides as follows:

Although specific equipments are shown for the user station 4 and data center 8 of FIG. 2, it should be understood that a variety of configurations could be utilized to enable the user station 4 to operate as an interface with users and to process application [*18] programs 116, and to enable the data center 8 to serve as a storage and retrieval center for data of common interest to the user stations.

'989 patent, col. 6, ll. 7-14. The specification then proceeds to differentiate the user computers from the data center computer in terms of function, explaining that a "user station . . . would be utilized to interact with the operator, generate payroll information, produce accounting reports, process accounts payable and accounts receivable, sort, compile, process hotel or airline reservation requests, and in general process data

pursuant to a variety of conventional application programs" while "the data centers . . . illustratively would serve to store data relating to the personnel of a company, payroll information regarding such personnel, accounts payable and accounts receivable data, information regarding occupancies and vacancies in a hotel chain or airline system, and generally any type of data which may be of interest to more than one user station" Id., col. 6, ll. 14-27. According to the Director, the specification thus makes clear that the term "user computer" is used to refer to the function of the computer in running [*19] a user application, not to the identification of the user computer as a personal computer as opposed to a mainframe.

American Academy argues that to read "user computer" to encompass mainframes and minicomputers would vitiate the word "user." The Board, however, recognized that the addition of the word "user" would "disqualify those computers that are designed as special purpose computers for some use and are not intended to be reprogrammed by users for their own benefits."

American Academy also points to the specification's reference to the Zilog Z-80 as a type of computer that could be used in a system embodying the invention. The Zilog Z-80, American Academy argues, was never intended to serve as a multi-user computer, and thus, according to American Academy, the reference to the Zilog Z-80 indicates that multi-user computers were not intended to be within the scope of "user computers" as that term was used in the '989 patent. The specification, however, describes the Zilog Z-80 as part of an "illustrative embodiment" of a "conventional microprocessor," not as an essential element of the invention. '989 patent, col. 5, ll. 27-32. Moreover, the examiner, citing a contemporaneous [*20] reference on microprocessors, determined that the Zilog Z-80 had the capability to function as a multi-user computer.

We agree with the Board that the description in the specification would not preclude a mainframe or a minicomputer from serving as the "user computer" of the invention. In general, the specification distinguishes a user computer from a data center computer in terms of function. Although some of the language of the specification, when viewed in isolation, might lead a reader to conclude that the term "user computer" is meant to refer to a computer that serves only a single user, the specification as a whole suggests a construction that is not so narrow. Instead, the specification indicates that the invention is intended to reach "a variety of configurations" including those in which the "user" is not a person, but is another device or machine. Thus, in light of the description in the specification, a construction of

"user computer" that includes multi-user computers, such as mainframes or minicomputers, is not unreasonably broad.

American Academy contends that the declarations of Dr. Maryanski, submitted at various points in the course of the reexamination proceedings, [*21] establish that one of ordinary skill in the art would understand the term "user computer" to mean a computer dedicated to a single user, and not a mainframe or minicomputer. See *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1325 (Fed. Cir. 2002) ("The ordinary meaning must be determined from the standpoint of a person of ordinary skill in the relevant art."); *In re Cortright*, 165 F.3d 1353, 1358 (Fed. Cir. 1999) ("Although the PTO must give claims their broadest reasonable interpretation, this interpretation must be consistent with the one that those skilled in the art would reach."). The Board upheld the examiner's determination that the declarations consisted only of Dr. Maryanski's personal opinions and did not constitute persuasive evidence in support of his conclusions.

The Board has broad discretion as to the weight to give to declarations offered in the course of prosecution. See *Velandier v. Garner*, 348 F.3d 1359, 1371 (Fed. Cir. 2003) ("Accord[ing] little weight to broad conclusory statements [in expert testimony before the Board] that it determined were unsupported by corroborating references [was] within the [*22] discretion of the trier of fact to give each item of evidence such weight as it feels appropriate."); cf. *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 294 (Fed. Cir. 1985) ("Opinion testimony rendered by experts must be given consideration, and while not controlling, generally is entitled to some weight. Lack of factual support for expert opinion going to factual determinations, however, may render the testimony of little probative value in a validity determination." (citations omitted)). Although there is "no reason why opinion evidence relating to a fact issue should not be considered by an examiner," *In re Alton*, 76 F.3d 1168, 1175 n.10 (Fed. Cir. 1996), the Board is entitled to weigh the declarations and conclude that the lack of factual corroboration warrants discounting the opinions expressed in the declarations, see *Velandier*, 348 F.3d at 1371; *Ashland Oil*, 776 F.2d at 294.

American Academy also asserts that the prosecution history of the original application that matured into the '989 patent supports its construction of the term "user computer." During prosecution, the PTO rejected [*23] the claims of the application based on a prior art patent to Anderson. The applicant characterized Anderson as including remote transaction terminals and a host data

processing system, in which the host, and not the remote terminals, processed the transactions. American Academy argues that the failure of the applicant and the examiner to characterize the host computer as a "user computer" is evidence that a user computer is intended to service a single user. However, the applicant distinguished the Anderson reference on the ground that the application programs were run on the host computer, rather than on remote transaction terminals. In effect, the applicant analogized the system of Anderson to the mainframe and dumb terminal configuration described in the Background of the Invention section of the '989 patent, with the remote transaction terminals of Anderson likened to dumb terminals. Thus, it would not have made sense for the applicant to compare the host computer of Anderson with the user computers of the application, since the user computers of the application were intended to replace devices analogous to the remote transaction terminals of Anderson. Accordingly, the discussion [*24] of the Anderson reference in the prosecution history of the original application for the '989 patent does not support American Academy's position.

Finally, American Academy points to an inconsistency between the Board's construction of the term "user computer" and that of the district court in American Academy's litigation against Novell. In the district court litigation, the court construed "user computer" to refer to a computer that serves one user at a time. However, the Board is required to use a different standard for construing claims than that used by district courts. We have held that it is error for the Board to "apply the mode of claim interpretation that is used by courts in litigation, when interpreting the claims of issued patents in connection with determinations of infringement and validity." *In re Zletz*, 893 F.2d 319, 321 (Fed. Cir. 1989); accord *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997) ("It would be inconsistent with the role assigned to the PTO in issuing a patent to require it to interpret claims in the same manner as judges who, post-issuance, operate under the assumption the patent is valid."). Instead, as we explained [*25] above, the PTO is obligated to give claims their broadest reasonable interpretation during examination. Under that standard, it was proper for the Board to construe "user computer" to encompass the mainframes and minicomputers of the cited prior art.

B

American Academy also challenges the Board's construction of the claim term "indirectly issuing." American Academy urges a construction that is limited to "a user computer application program issuing a call for data as though from resident storage, coupled with an

intermediate step redirecting the call to the remote data center computer." The Board, however, construed the term as "requiring only that a request from the host computer go through some other component before it is sent to the database."

The primary argument offered by American Academy is that the '989 patent's specification limits the construction of "indirectly issuing." In particular, American Academy asks us to limit that claim term to the database simulator program of the preferred embodiment described in the specification:

The data base simulator program 118 is somewhat similar in operation to a data base manager and enables an application program 116 at [*26] the user station to call for storage or retrieval of data from the data center as though it were calling for data from a data base resident at the user station 4.

'989 patent, col. 6, ll. 57-62.

We have cautioned against reading limitations into a claim from the preferred embodiment described in the specification, even if it is the only embodiment described, absent clear disclaimer in the specification. See *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004) ("Even when the specification describes only a single embodiment, the claims of the patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using 'words or expressions of manifest exclusion or restriction.'"); *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1325 (Fed. Cir. 2002).

Rather than restricting the meaning of "indirectly issuing," the specification describes the invention broadly:

In operation, a user station initiates contact (inquires) with a data center using any of a variety of conventional protocol procedures, and the data center, which is always operating in an access mode under [*27] control of a data access control program, responds to the inquiry and communication is established.

'989 patent, col. 3, ll. 3-9. The specification makes clear that the database simulator is a preferred embodiment, and just one of the "variety of conventional protocol procedures":

In a preferred embodiment of the present invention, the data center

computer manages data bases for the independently operating user computers by means of a data base manager program. The user computers store, retrieve, and update data items in their data bases by communicating data base calls to the data center computer. The user computers run respective user application programs to process their data and to each of which is linked a data base simulator program. When a user application program reaches a point in processing at which a data operation on a data item is needed, the user application program calls the data base simulator program and supplies it with sufficient information to issue a data base call to the data center computer to perform the required data operation.

Id., col. 3, ll. 29-44. Thus, the specification does not limit the term "indirectly issuing" to the use of [*28] a database simulator.

As it did in the case of the claim term "user computer," American Academy provided evidence in the form of declarations of Dr. Maryanski in support of its construction of "indirectly issuing." The Board found that those declarations were unpersuasive for the same reasons that they were found unpersuasive with respect to the term "user computer." As we explained above, the Board is entitled to give such weight to declarations as it deems appropriate. The Board was acting within its broad discretion in giving little weight to the declarations. Because the specification does not support American Academy's narrower construction of the claim term "indirectly issuing," the Board properly concluded that the broadest reasonable interpretation of "indirectly issuing" requires "only that a request from the host computer go through some other component before it is sent to the database."

American Academy does not dispute that, under the Board's claim construction, substantial evidence supports the Board's finding of anticipation. Because we affirm the Board's claim construction both as to the term "user computers" and as to the term "indirectly issuing," we affirm its [*29] finding of anticipation as well. Having upheld the Board's anticipation rejections, we do not need to address American Academy's arguments regarding the Board's rejections of the same claims on the ground of obviousness. We therefore uphold the Board's decision based on its findings that the contested claims are anticipated, and we do not address the other issues presented in the parties' briefs.

AFFIRMED.

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ACLM/"anodically bonded"

PAT. NO.	Title
1 6,734,619	T Anodically bonded elements for flat-panel displays
2 6,725,724	T Manufacturing method for a thin-film high-pressure sensor
3 6,670,024	T Glass-silicon column
4 6,647,035	T Ruggedized microchannel-cooled laser diode array with self-aligned microlens
5 6,640,640	T Differential pressure sensor
6 6,639,289	T Dissolved wafer fabrication process and associated microelectromechanical device having a support substrate with spacing mesas
7 6,598,482	T Overload resistant differential pressure sensor
8 6,559,530	T Method of integrating MEMS device with low-resistivity silicon substrates
9 6,550,337	T Isolation technique for pressure sensing structure
10 6,548,322	T Micromachined gas-filled chambers and method of microfabrication
11 6,545,406	T Anodically-bonded elements for flat panel displays
12 6,537,938	T Glass for anodic bonding
13 6,525,462	T Conductive spacer for field emission displays and method
14 6,521,447	T Miniaturized thermal cycler
15 6,511,894	T MEMS relay and method of fabricating the same
16 6,504,290	T Electrode structure of piezoelectric vibrator
17 6,491,561	T Conductive spacer for field emission displays and method
18 6,407,485	T Piezoelectric vibrator
19 6,349,588	T System and method for performing bulge testing of films, coatings and/or layers
20 6,329,750	T Anodically-bonded elements for flat panel displays

- 21 [6,310,395](#) [T Electronic component with anodically bonded contact](#)
 - 22 [6,268,647](#) [T Electronic component with an insulating coating](#)
 - 23 [6,204,506](#) [T Back illuminated photodetector and method of fabricating the same](#)
 - 24 [6,181,009](#) [T Electronic component with a lead frame and insulating coating](#)
 - 25 [6,127,629](#) [T Hermetically sealed microelectronic device and method of forming same](#)
 - 26 [6,120,339](#) [T Methods of fabricating flat panel evacuated displays](#)
 - 27 [6,089,099](#) [T Method for forming a bonded silicon-glass pressure sensor with strengthened corners](#)
 - 28 [6,078,103](#) [T Dimpled contacts for metal-to-semiconductor connections, and methods for fabricating same](#)
 - 29 [6,077,721](#) [T Method of producing an anodic bonded semiconductor sensor element](#)
 - 30 [6,072,924](#) [T Optical switch and method for assembling the same](#)
 - 31 [6,055,865](#) [T Semiconductor pressure sensor](#)
 - 32 [6,004,179](#) [T Methods of fabricating flat panel evacuated displays](#)
 - 33 [6,002,661](#) [T Deformable mirror and optical data reproducing apparatus using the same](#)
 - 34 [5,914,562](#) [T Anodic bonded plasma addressed liquid crystal displays](#)
 - 35 [5,900,671](#) [T Electronic component including conductor connected to electrode and anodically bonded to insulating coating](#)
 - 36 [5,890,745](#) [T Micromachined fluidic coupler](#)
 - 37 [5,846,392](#) [T Miniaturized circulatory measuring chamber with integrated chemo- and/or biosensor elements](#)
 - 38 [5,839,467](#) [T Micromachined fluid handling devices](#)
 - 39 [5,827,343](#) [T Process for changing the bend of anodically bonded flat composite bodies made of glass and metal or semiconductor materials](#)
 - 40 [5,820,648](#) [T Anodic bonding process](#)
 - 41 [5,796,209](#) [T Gas discharge lamps and lasers fabricated by micromachining](#)
 - 42 [5,783,309](#) [T Recovery of an anodically bonded glass device from a substrate by use of a metal interlayer](#)
 - 43 [5,769,997](#) [T Method for bonding an insulator and conductor](#)
 - 44 [5,764,001](#) [T Plasma addressed liquid crystal display assembled from bonded elements](#)
 - 45 [5,763,903](#) [T Avalanche photodiode for light detection](#)
 - 46 [5,717,287](#) [T Spacers for a flat panel display and method](#)
 - 47 [5,705,070](#) [T Micromachined filters](#)
 - 48 [5,681,741](#) [T In situ PCR amplification system](#)
 - 49 [5,660,728](#) [T Micromachined fluid handling apparatus with filter](#)
 - 50 [5,610,431](#) [T Covers for micromechanical sensors and other semiconductor devices](#)
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Results of Search in 1976 to present db for:

ACLM/"anodically bonded": 77 patents.

Hits 51 through 77 out of 77

Prev. 50 Hits

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Refine Search

PAT. NO.	Title
51 5,604,363	Semiconductor pressure sensor with package
52 5,587,601	Support structure for a semiconductor pressure transducer
53 5,488,864	Torsion beam accelerometer with slotted tilt plate
54 5,463,411	Electrothermal ink print head
55 5,446,616	Electrode structure and method for anodically-bonded capacitive sensors
56 5,388,460	Capacitive sensor for detecting a physical value such as acceleration
57 5,365,790	Device with bonded conductive and insulating substrates and method therefore
58 5,324,326	Pressure sensing pacing lead
59 5,264,820	Diaphragm mounting system for a pressure transducer
60 5,186,055	Hermetic mounting system for a pressure transducer
61 5,173,836	Hermetically sealed interface
62 5,101,665	Semiconductor pressure sensor
63 5,068,205	Header mounted chemically sensitive ISFET and method of manufacture
64 5,061,987	Silicon substrate multichip assembly
65 4,943,032	Integrated, microminiature electric to fluidic valve and pressure/flow regulator
66 4,821,997	Integrated, microminiature electric-to-fluidic valve and pressure/flow regulator
67 4,773,972	Method of making silicon capacitive pressure sensor with glass layer between silicon wafers
68 4,772,523	Stress relief substrate metallization
69 4,746,893	Pressure transducer with sealed conductors
70 4,703,658	Pressure sensor assembly
71 4,632,871	Anodic bonding method and apparatus for X-ray masks

- 72 [4,617,606](#) [Capacitive pressure transducer](#)
73 [4,578,735](#) [Pressure sensing cell using brittle diaphragm](#)
74 [4,542,435](#) [Pressure transducer and mounting](#)
75 [4,312,008](#) [Impulse jet head using etched silicon](#)
76 [4,306,243](#) [Ink jet head structure](#)
77 [4,303,903](#) [Pressure sensitive apparatus](#)
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In re Patent Application of
PIKE ET AL.
Serial No. **09/741,754**
Filed: **DECEMBER 19, 2000**



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Dawn K. Miller